

REMARKS

1. *Status of claims*

Claims 1, 3-4, 6-10, and 12-19 are pending and under consideration.

2. *Claim rejections under 35 U.S.C. § 103(a)*

The Examiner rejected claims 1, 3-4, 6-10, and 12-19 as being unpatentable over Erlanger, *et al.*, US 6,593,137 ("Erlanger"), in view of Haberzettl, *Nanotechnology* 13 (2002) R9-R13 ("Haberzettl"), and Williams, *et al.*, *Int. J. Radiat. Oncol. Biol. Phys.* (1990 Sep) 19(3):633-642 ("Williams"). Applicants traverse this rejection.

Erlanger, as has been discussed previously, teaches antibodies specific to fullerenes. Williams, as has been discussed previously, teaches two radiolabeled antibodies, each one specific to a particular tumor-associated antigen. Haberzettl discusses the possible "application of nanotechnology to medicine," speculating that "[a]dvances in both diagnostic tools and the development and administration of therapeutics *may* soon come together for the creation of nanoscale devices known as nanorobots or more simply, nanobots" (p. R9, first column, second paragraph; emphasis added). As should be apparent, Haberzettl is directed to a hypothetical device that neither he nor any other worker has constructed or even shown how to construct.

Haberzettl discusses components a nanobot *might* include as being an architecture or structure to carry a payload, the payload, and targeting mechanisms, among others. Regarding architectures or structures, buckyballs, fullerenes, and nanotubes are mentioned along with dendrimers, nanoparticles, nanocrystals, viruses, and encapsulated cells. Haberzettl states the "hollow internal structure and ability to be functionalized allows [buckyballs, fullerenes, and nanotubes] to carry a payload" (p. R10, second column, "Buckyballs..." paragraph). However,

Haberzettl provides no guidance to the person of ordinary skill in the art at least as to how a buckyball, fullerene, or nanotube would carry a payload; how a payload could be incorporated into the hollow internal structure; how a payload could be released from the hollow internal structure; how the buckyball, fullerene, or nanotube could be functionalized; what functionalizations, if any, would render the buckyball, fullerene, or nanotube able to carry a payload; and whether a buckyball, fullerene, or nanotube would be as or more effective than dendrimers or other architectures in the construction of Haberzettl's hypothetical nanobot. Haberzettl's teachings regarding nanobot structure represent a wish, not a concrete result.

Likewise, Haberzettl teaches that "[t]he *most likely* mechanisms [for targeting a particular tissue or organ] to be employed are based on antigen/antibody interactions or binding of target molecules to membrane-bound receptors" (paragraph bridging R10-R11). Haberzettl provides no guidance to the person of ordinary skill in the art at least as to how antigen/antibody interactions would be employed to target a particular tissue; how they would be physically incorporated into a architecture; or whether they would be as or more effective than binding of target molecules to membrane-bound receptors or any other technique not listed in Haberzettl. Haberzettl's teachings regarding nanobot targeting represent a wish, not a concrete result.

Similarly, Haberzettl teaches "a currently available therapeutic agent formulated into a nanoarchitecture" (p. R11, first column, section 2.3, second paragraph), but provides no guidance to the person of ordinary skill in the art at least as to whether a therapeutic agent could be formulated into a buckyball, fullerene, or nanotube; even if possible, how a therapeutic agent could be formulated into a buckyball, fullerene, or nanotube; and which nanoarchitectures would be effective for this use. Haberzettl's teachings regarding nanobot payloads represent a wish, not a concrete result.

In summary, Haberzettl's speculative and hypothetical teachings, ungrounded with any reference to the chemistry of buckyballs, fullerenes, nanotubes, functionalizations thereof, targeting mechanisms, payloads, and the combination thereof into useful structures, give the person of ordinary skill in the art no motivation to combine Haberzettl with either or both of Erlanger or Williams. Therefore, Applicants submit this rejection of claims 1, 3-4, 6-10, and 12-19 is improper and request it be withdrawn.

3. *Conclusion*

Applicants submit all pending claims are in condition for allowance. The Examiner is invited to contact the undersigned patent agent at (713) 934-4065 with any questions, comments or suggestions relating to the referenced patent application.

Respectfully submitted,

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